The invention relates to a structural member of the type comprising a body with a cavity, plastic reinforcing ribs in the cavity, and means for fixing the ribs to the body.

The invention applies particularly to motor vehicles in which members of the abovementioned type can be used, for example, as front faces, bumper beams, or door panels.

A member of this type is known from EP-0 370 342. In this member the ribs are fixed to the body using openings formed in the body, the plastic material of the ribs passing through these openings and projecting around them. Fixing can also be completed by moulding the plastic material of the ribs onto reliefs formed on the inside of the body. However, it is a relatively complicated task to produce such a structural member, as the need for the plastic material to pass through openings distributed around the body makes the moulds relatively complex, particularly if they are to be sufficiently leaktight.

An object of the invention is therefore to provide a structural member of the abovementioned type that can be produced more simply.

To this end, the subject of the invention is a structural member of the abovementioned type, characterized in that the fixing means comprise discrete regions set back from at least one outer edge of the body, and blocks that are part of the same moulding as the ribs, which blocks envelop the outer edge in its set-back regions.

In accordance with certain particular embodiments, the structural member may include one or more of the following characteristics, taken in isolation or in all technically possible combinations:

- the set-back regions have stepped shapes with angles,
- the set-back regions have at least some parts that converge away from the body,

- the converging parts of the set-back regions are basically trapezium-shaped,
- the set-back regions are formed by cutouts in the body,
- the fixing means comprise discrete regions set back from two outer edges of the body on both sides of the cavity and blocks that are part of the same moulding as the ribs and envelop the two edges in their set-back regions, and
- the body is made of metal.

The invention also relates to a motor vehicle fitted with a structural member as defined above.

A clearer understanding of the invention will be gained from the following description which is provided purely by way of example and refers to the accompanying drawings, in which:

- Figure 1 is a partial schematic view of a structural member according to the invention,
- Figures 2 and 3 are partial schematic sectional views taken on planes II-II and III-III, respectively, shown in Figure 1,
- Figure 4a is a schematic side view of a cutout in the body of the member shown in Figure 1 and
- Figures 4b to 4e are views similar to Figure 4a showing variants of the member of Figure 1.

Figures 1 to 3 illustrate a structural member 1, designed for example to form an upper part of a front face of a motor vehicle.

This member 1 is a length member comprising a concave base body 2 defining an internal cavity 3. More specifically, the body 2 shown is a metal channel section extending in a longitudinal direction L. The body 2 may have been produced by, for example, drawing a sheet of aluminium or other metal.

The member 1 also comprises reinforcing V ribs 4, contiguous with each other and laid out, inside the cavity 3 on the web 5 of the body 2, one after the other along the direction L.

The ribs 4 are made up of the successive parts of a sheet 6 of a plastic material. The sheet 4 zigzags between the two side flanges 7 of the body 2. The plastic material of the sheet 4 may be polyamide or polypropylene.

The ribs 4 are connected rigidly to the body 2 by means of fixing blocks 10 that are part of the same moulding as the ribs 4 and envelope the upper outer edges 11 of the flanges of the body 2 in the cutout 12 formed in the upper edges of the flanges 7.

These cutouts 12 are identical and rectangular, as can be seen in Figure 4a. These cutouts 12 therefore define discrete regions set back from the edges 11.

All the cutouts 12 of one edge 11 are at regular intervals from each other. The cutouts 12 alternate between the two edges 11 situated on either side of the cavity 3.

Each fixing block 10 envelopes the corresponding outer edge 11 for a slightly greater length than the corresponding cutout 12. More precisely, the block 10 in question comprises an essentially rectangular internal plate 13 extending inside the cavity 3 against the corresponding flange 7 over the whole height of the latter. The block 10 also has an external plate 14 whose dimensions are slightly greater than those of the cutout 12, but whose height and length are much less than those of the internal plate 13. This external plate 14 lies against the outside surface of the corresponding flange 7. The plates 13 and 14 are connected by a connecting part 15 that is part of the same moulding as the plates 13 and 14 and extends through the cutout 12.

All the blocks 10 of either edge 11 are connected to each other by rails 18 that are part of the same moulding as the blocks 10 connected to each other by rails 18 that are part of the same moulding as the blocks 10 and envelope the edges 11.

The internal plates 13 of the blocks 10 and the ribs 4 possess enlarged lower parts 20 forming supporting feet on the web 5 of the body 2.

The blocks 10 are situated at each meeting point of the ribs 4.

The meeting points of the ribs 4 are part of the same moulding as the blocks 10 in the central regions of the internal plates of the blocks 10. The ribs 4 are therefore supported laterally on the flanges 7 of the body 2 via the internal plates 13 of the blocks 10.

The structural member 1 can be produced by, for example, injection overmoulding of the plastic material of the ribs 4, blocks 10 and rails 18 onto the body 2.

The structural member 1 is therefore light, relatively inexpensive and has good mechanical properties, notably a relatively high stiffness.

The ribs 4 are joined rigidly to the body 2 by fixing the blocks 10 to the edges 11 in the cutouts 12, without any need for other means of fixing it in areas of the body 2 other than its edges 11. In particular, there is no need to cut orifices in the web 5 and flanges 7 of the body 2 for the plastic material of the ribs 4 to pass through.

The structural member 1 can therefore be produced in relatively simple moulds in which the only place where the plastic material must be allowed to pass through the walls of the body 2 is at the outer edges 11.

Additionally, the invention can be used to produce structural members in which the ribs 4 are fixed to the body 2 in an at least partly different way to that in EP 0 370 342.

The attachment of the plastic material in the body 2 can be done by means of cutouts 12 of shapes other than the shape shown in Figure 4a.

In the variant shown in Figure 4b, the cutouts 12 are stepped so as to correspond to an upper rectangle 22 of greater length and a lower rectangle 23

of shorter length. The cutouts 12 are therefore roughly T-shaped. This variant improves the attachment of the blocks 10 to the flanges 7 because of the many angles 24 present in each cutout 12.

In the variant shown in Figure 4c, each cutout 12 is basically in the shape of a re-entrant dovetail or trapezium. The cutouts 12 converge away from the body 2.

This variant also enhances the fixing of the ribs 4 to the body 2.

In the variant shown in Figure 4d, each cutout 12 has a stepped shape corresponding to a longer upper rectangle 25 and to a shorter lower re-entrant dovetail or trapezium.

The attachment of the blocks 10 to the flanges 7 is improved by the many angles 27 of the cutouts 12 and by the fact that the trapezia 26 converge away from the body 2.

In the variant shown in Figure 4e, the cutouts 12 are essentially V-shaped.

In other variants, the body 2 may be made of plastic rather than metal.

In yet another variant, the rails 18 are omitted.

More generally, the ribs 4 may be shaped differently - for example, X-shaped.